

# Notice of Allowability

Application No.

10/009,982

Examiner

Susan S. Lee

Applicant(s)

NAKASHIMA ET AL

Art Unit

2852

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 11/21/03.
2. ☒ The allowed claim(s) is/are 2 and 6-30.
3. ☒ The drawings filed on 12 December 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
  - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**


7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

- |  |   |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 6 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____             |
| 3 <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____  | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment                  |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
|  | 9 <input type="checkbox"/> Other _____  |

  
Susan S. Lee  
Primary Examiner  
Art Unit: 2852

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

This application is in condition for allowance except for the presence of claims 3-5 and 31-56 to groups II - VI non-elected without traverse. Accordingly, claims 3-5 and 31-56 have been cancelled. Although applicant has stated that these claims are withdrawn in amendment filed 11/21/03, the status of the claims do not change from withdrawn to cancelled without cancelling them.

The application has been amended as follows:

Please CANCEL claims 3-5 and 31-56 accordance with the following:

1. (previously cancelled)

2. ~~(previously amended)~~ A liquid-development electrophotographic apparatus, comprising:  
a development section using a nonvolatile, high-viscosity, high-concentration  
liquid toner as a liquid developer, the development section being in contact with an image bearer  
body, on which an electrostatic latent image is formed, so as to supply the liquid developer onto  
the image bearer body, and causing toner particles contained in the liquid developer to adhere to  
the image bearer body according to an electric field established between the development  
section and the image bearer body to thereby form a toner image;  
an intermediate transfer body to which the toner image is transferred from the  
image bearer body according to an electric field established between the same and the image  
bearer body; and  
a transfer-and-fixation section including a heater for melting the toner image  
transferred onto the intermediate transfer body through application of heat at a contact portion  
between the intermediate transfer body and a printing medium to thereby melt-transfer the toner  
image onto the printing medium,  
wherein the intermediate transfer body is equipped with a carrier-removing roller  
which comes into contact with a toner layer forming an image thereon in order to remove  
excessive oil from the toner layer and to which a bias voltage is applied in such a direction as to  
press toner particles against the intermediate transfer body retaining an image; and  
wherein a material having low surface energy is used as a surface material,  
serving as an image formation surface, of the intermediate transfer body, and an electric  
resistance of the surface material is set to a semiconductive range of  $1E4-1E12 \Omega$ , wherein

after excessive oil is removed by means of the carrier-removing roller and before transfer onto printing paper is performed, an electric field is applied in a direction of transfer at such an intensity as not to effect transfer, thereby weakening a force of retaining toner on the image formation surface and thus realizing high efficiency of transfer onto the paper.

3-5. (cancelled)

6. (previously presented) A liquid-development electrophotographic apparatus comprising a development section using a liquid toner as a developer, the development section being in contact with an image bearer body, on which an electrostatic latent image is formed, so as to supply the developer onto the image bearer body, and causing toner particles contained in

the developer to adhere to the image bearer body according to an electric field established between the development section and the image bearer body to thereby form a toner image; an intermediate transfer section to which the toner image is transferred from the image bearer body; and a transfer-and-fixation section for melting the toner image transferred onto the intermediate transfer section through application of heat at a contact portion between the intermediate transfer section and a printing medium to thereby melt-transfer the toner image onto the printing medium,

wherein the intermediate transfer section is equipped with an excessive-carrier-removing mechanism for removing excessive oil from a toner layer that forms an image on the intermediate transfer section; and

wherein the excessive-carrier-removing mechanism comprises a semiconductive carrier-removing roller or belt which comes into contact with the toner layer heated to not lower than a melting temperature thereof or a temperature near the melting temperature and to which a bias voltage is applied in such a direction as to press toner particles against the intermediate transfer section retaining an image.

7. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein the intermediate transfer section comprises a heat roller and an intermediate transfer belt looped around and mounted on the heat roller, for melting the transferred toner image through application of heat to thereby melt-transfer the toner image onto the printing medium; and a plurality of carrier-removing rollers are provided in such a manner as to abut the heat roller.

8. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 7, wherein a force which each of the plurality of carrier-removing rollers imposes on the intermediate transfer belt is set individually.

9. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 7, wherein a bias voltage with respect to the intermediate transfer belt to be applied to each of the plurality of carrier-removing rollers is set individually.

10. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 7, wherein hardness of each of the plurality of carrier-removing rollers is set individually.

11. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 7, wherein surface hardness of each of the plurality of carrier-removing rollers is set individually.

12. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 8, wherein a force which each of the carrier-removing rollers imposes on the intermediate transfer belt is adjusted on the basis of analysis of a print pattern.

13. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 9, wherein a bias voltage to be applied to each of the carrier-removing rollers is adjusted on the basis of analysis of a print pattern.

14. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 7, wherein the carrier-removing rollers are oriented such that polish grains of the rollers do not disturb an image.

15. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, further comprising means for heating the carrier-removing roller and means for detecting temperature of the carrier-removing roller, so as to control the temperature of the carrier-removing roller at a constant level, thereby maintaining the carrier-removing roller at a constant electric resistance for stable carrier removal.

16. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein the intermediate transfer section comprises an intermediate transfer roller for superposing toner images in a plurality of colors through transferring the toner images thereto from corresponding image bearer bodies, and an intermediate transfer belt having the superposed toner images transferred thereto at one time from the intermediate transfer roller and functioning to melt the superposed toner images through application of heat at a contact portion between the same and a printing medium to thereby melt-transfer the superposed toner images onto the printing medium, and wherein time required to superpose the toner images in the plurality of colors on the intermediate transfer roller is utilized for controlling a speed of the intermediate transfer belt at the time of melt transfer within such a range as not to affect throughput.

17. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 16, wherein the speed of the intermediate transfer belt is controlled such that the intermediate transfer belt is rotated a plurality of times during a time between transfer of the toner images from the intermediate transfer roller to the intermediate transfer belt and melt transfer of the toner images onto the printing medium.

18. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 17, further comprising means for monitoring the number of rotations of the intermediate transfer belt and changing a bias voltage to be applied to the carrier-removing roller, according to the number of rotations.

19. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 17, further comprising means for monitoring the number of rotations of the intermediate transfer belt and changing a force which the carrier-removing roller imposes on the intermediate transfer belt, according to the number of rotations.

20. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein the intermediate transfer section comprises an intermediate transfer roller for superposing toner images in a plurality of colors through transferring the toner images thereto from corresponding image bearer bodies, and an intermediate transfer belt having the superposed toner images transferred thereto at one time from the intermediate transfer roller and functioning to melt the superposed toner images through application of heat at a contact portion between the same and a printing medium to thereby melt-transfer the superposed toner images onto the printing medium, and wherein a surface potential of the intermediate transfer belt retaining a heated toner layer is detected; an amount of residual carrier on the intermediate transfer belt is determined from a table describing a relation of the surface potential to the amount of residual carrier; and when the amount of residual carrier is large, the intermediate transfer belt is rotated two rotations.

21. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 20, wherein a plurality of carrier-removing rollers are provided in such a manner as to abut the intermediate transfer belt and such that the carrier-removing rollers can abut and retreat from the intermediate transfer belt independently of one another, and wherein

the number of carrier-removing rollers abutting the intermediate transfer belt is controlled according to the amount of residual carrier.

22. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein the intermediate transfer section comprises an intermediate transfer roller for superposing toner images in a plurality of colors through transferring the toner images thereto from corresponding image bearer bodies, and an intermediate transfer belt having the superposed toner images transferred thereto at one time from the intermediate transfer roller and functioning to melt the superposed toner images through application of heat at a contact portion between the same and a printing medium to thereby melt-transfer the superposed toner images onto the printing medium, and wherein a reflection-type optical sensor for detecting gloss whose incident angle of light and reflection angle of light are the same is provided on the intermediate transfer belt retaining the heated toner layer; an amount of residual carrier on the intermediate transfer belt is determined from a reflection output from the optical sensor; and when the amount of residual carrier is large, the intermediate transfer belt is rotated two rotations.

23. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 22, wherein a plurality of carrier-removing rollers are provided in such a manner as to abut the intermediate transfer belt and such that the carrier-removing rollers can abut and retreat from the intermediate transfer belt independently of one another, and wherein the number of carrier-removing rollers abutting the intermediate transfer belt is controlled according to the amount of residual carrier.

24. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein in order to prevent a change in resistance of the carrier-removing roller caused by partial temperature rise of the carrier-removing roller, the carrier-removing roller is retreated from the intermediate transfer section when the carrier-removing roller faces a region other than a print region or when printing is not performed.

25. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein the carrier-removing roller is caused to rotate through contact with the intermediate transfer section, which is heated, to thereby be heated to a certain temperature through thermal conduction.

26. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 25, wherein a resistance of the carrier-removing roller is calculated from voltage and current as measured when the voltage is applied between the carrier-removing roller and the intermediate transfer section while the carrier-removing roller is in contact with the intermediate transfer section, and heating is controlled such that the resistance falls within a predetermined range.

27. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein temperature of the carrier-removing roller or temperature of a last carrier-removing roller among a plurality of carrier-removing rollers is set higher than temperature of the intermediate transfer section.

28. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein a bias voltage to be applied to the carrier-removing roller is changed according to the number of colors of toner images to be superposed on the intermediate transfer section.

29. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein a bias voltage to be applied to the carrier-removing roller is controlled so as to limit current to a low level which does not cause variation in electric potential of the intermediate transfer section to thereby avoid influence of the variation on superposition transfer onto the intermediate transfer section.

30. (previously presented) A liquid-development electrophotographic apparatus as described in Claim 6, wherein a blade for scraping off carrier liquid from the carrier-removing roller has a plurality of protrusions projecting gravitationally downward so as to cause the carrier liquid collected at a blade tip to drip promptly.

31-56. (cancelled)

The following is an examiner's statement of reasons for allowance:



The primary reason for allowance of claim 2 is the inclusion of after excessive oil is removed by means of the carrier-removing roller and before transfer onto printing paper is performed, an electric field is applied in a direction of transfer at such an intensity as not to effect transfer, thereby weakening a force of retaining toner on the image formation surface and thus realizing high efficiency of transfer onto the paper. This is found in all of claim 2, but not disclosed nor suggested by the prior art of record.

The primary reason for allowance of claims 6-30 is the inclusion of the excessive-carrier-removing mechanism comprises a semiconductive carrier-removing roller or belt which comes into contact with the toner layer heated to not lower than a melting temperature thereof or a temperature near the melting temperature and to which a bias voltage is applied in such a direction as to press toner particles against the intermediate transfer section retaining an image. This is found in all of claims 6-30, but not disclosed nor suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan S. Lee whose telephone number is 703-308-

Art Unit: 2852

2138. The examiner can normally be reached on Mon. - Fri., 10:30-8:00, Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Art Grimley can be reached on 703-308-1373. The fax phone number for the organization where this application or proceeding is assigned is 703-305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
Susan S. Lee  
Primary Examiner  
Art Unit 2852

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